STATED MEETING, September 20, 1842.

Vice President Morton in the Chair.

DONATIONS TO MUSEUM.

Dried Specimens of Hydrodyctum pentagonum. From Dr. Goddard.

Two Specimens of Arseniuret of Antimony and Iron from Leominster, Worcester Co., Mass. Presented by Mr. W. R. Kendall, through Prof. Johnson.

A Specimen, in spirits, of Plectiodon erythrocephalus, from Virginia. Presented by Mr. Josiah Curtis, through Dr. Morton.

DONATIONS TO LIBRARY.

Transactions of the Linnean Society, Vol. XIX, Part 1, with a list of the members of the Society for 1842. From the Society.

Constitution and First Annual Report of the Northern Academy of Arts and Sciences. Hanover, New Hampshire, 1842. From the Academy.

WRITTEN COMMUNICATIONS.

The Corresponding Secretary read letters

From Mr. William Vaughan, dated London, August 5, 1842, accompanying the presentation of the Transactions of the Linnean Society:

From the same gentleman, dated London, August 8, 1842, acknowledging the receipt of the letter of the Corresponding Secretary, enclosing the Resolutions adopted by the Academy, having reference to the decease of his relative, the late John Vaughan, Esq., of Philadelphia.

From the Secretary of the Linnean Society, dated London, June 25, 1842, acknowledging the receipt of Nos. 4 to 8 of the Proceedings of the Academy.

From Dr. William Johnson, dated Factory Island, Liberia, June 11, 1842, and from Mr. Spencer F. Baird, dated Carlisle, Pennsylvania, September 15, 1842, severally acknowledging the receipt of their notices of election as Correspondents of the Academy.

The Chairman read a note from Dr. Edmund Ravenel, dated Charleston, S. C., August 24, 1842, alluding to a fossil Scutella, regarded by him as probably new; accompanied by sketches and a partial description of the same.

VERBAL COMMUNICATIONS.

Prof. Johnson exhibited and explained a method of applying the galvanometer to the purpose of testing the relative destructibility of different samples of sheathing copper when exposed to the action of salt water. He referred to the fact that, in early periods of the use of copper for sheathing the bottoms of vessels, while iron bolts were still used for fastenings, the copper lasted much longer than at present, while the iron itself was rapidly corroded; that copper bolts having been substituted for iron ones, the sheathing exhibited a much more rapid decay than before. He likewise alluded to the fact that the practice of fastening on sheathing copper with composition nails, offers an antagonist electric force to that of the copper, rendering the latter more highly electro-positive, and thus facilitating its union with the electro-negative elements of sea water. It was also mentioned, that in removing the copper from ships, some sheets are often found much more corroded than the rest, and that this takes place among sheets manufactured at the same works, and apparently with equal care in freeing the metal from impurities.

It was further mentioned that long experience had evinced the uncertainty of obtaining *durable* copper by efforts to approximate chemical purity in the manufacture, and that in copper free from other metals the oxide of copper is sometimes detected both in the interior and on the exterior of the mass, rendering it earthy in appearance, and liable to be disintegrated as well as corroded. In proof of this latter effect he exhibited a quantity of copper particles brushed from a sheet of that metal which had been worn several years between the keel and the false keel of an English sloop of war, where, though the salt water could penetrate and corrode it, the disintegrated particles could not be reached by the waves to be washed away.

As the comparative electric energy of two sheets of copper is proportionate to the amount of corrosion going on, and as the quantity of electricity set in motion also determines the influence of its current on a magnetic needle, the deflection of that of a common galvanometer may be made to determine the relation of two sheets to each other, and thus to ascertain whether they are suitable to be associated together on the bottom of the same vessel.

Two methods were described and illustrated by which this may be accomplished. The first is to oppose in succession the several sheets of copper to a sheet of platina constituting the negative element of the pair, and observing

the deflections which the several copper sheets produce in the needle of the galvanometer. The other is to oppose all the sheets of sheathing copper to one of chemically pure copper deposited by the galvanotype process.

Both these methods were exhibited in connexion with several specimens of sheathing copper, the specimens which had, by analysis, been shown to be the purest copper, exhibiting the highest electro-positive energy when compared with platina, and the lowest electro-negative power when opposed to the galvanotype plate. Composition nails were found near platina in the scale, and galvanotype copper not so widely removed from iron as are some varieties of brass.

The arrangement of apparatus supposed to be best adapted for use in practice, is a triple astatic needle, having its middle needle within, its lower one below, and its upper one above a spiral of copper ribbon, formed in such a manner as to present the edges of the ribbon to the upper and under surfaces of the needles. The suspension may be either that of a pivot, or that of a single or double support of unspun silk. The liquid preferred for use, in this species of test, is common sea water; being the same to which practice subjects the sheathing copper, and having the advantage of being easily procured, costing nothing, and capable, therefore, of being renewed as often as the operator may think fit.

MEETING FOR BUSINESS, SEPTEMBER 27, 1842.

VICE PRESIDENT MORTON in the Chair.

The Monthly Report of the Corresponding Secretary was read and adopted.

ELECTIONS.

Jacob P. Giraud, Jr., Esq., of New York, was elected a Correspondent:

And John Cassin, Esq., of Philadelphia, a member of the Academy.